



## **Residential towers design with an emphasis on social sustainability criteria**

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### **Abstract**

The subject of housing has always been one of the important subjects of human societies and given historical, social, climatic and technological facilities and conditions it has resulted in the creation of various patterns and methods of habitation. Housing is the foundation of cultural and economic vitality and it is a significant factor in the life quality. With the emergence of industrial revolution in 18<sup>th</sup> and 19<sup>th</sup> centuries and technological development, such inventions and factors as industrial development, population growth and urbanization as well as the increase of modern architectural technologies and construction industry evolved and as a result, the methods of habitation and architectural methods gained a new form. Following these evolutions, cities grew faster and the need to consider vertical development of cities and societies paved the ground for the evolution and development of residential towers in contemporary forms. Moreover, in 20<sup>th</sup> century, such factors as the necessity of more land use, people's demand for living and work in city centers, etc. necessitated the construction of high buildings in big cities more than ever. The concept of sustainable development is an important change in understanding the relationship between human being and environment and humans with each other, the aspect of sustainable social development has not received much attention. Social sustainability involves the way the people, societies and communities live together, achieve development goals (selected for themselves) and understand the Physical borders and their territory as an integrated whole. Based on this definition, social sustainability combines political and social principles such as justice and health to the subjects related to participation, requirement, social capital, economy, environment and recently the concept of happiness, welfare and life quality. One of important issues in residential high buildings is social sustainability. Social behavior and interactions of residents in these places are under the influence of different factors. In designing mass complexes such as residential towers, division of private and public spaces and providing security in private space of residents is an important point. Designing high – rise buildings where there are many families with different cultures in a collective territory is a difficult job, because the architect must consider the architecture proportional to the living condition of different groups, so that social sustainability is implemented in the residential environment. The main concern of this study is emphasis on the aspect of social sustainability and studying it in residential towers. Based on what said above, the present study tries to investigate the aspects of social sustainability development and its impact in residential towers. In this paper, various aspects of sustainable development with social approach in design of residential buildings will be discussed. The research method is a descriptive analysis using library resources. Designing a residential tower is to establish a strong link between residents and natural environment which this link caused by trying to find identity or in other meaning sense of belonging to a place.

**Key words:** habitation - Sustainable development- Social sustainability- residential towers



## 1. Introduction

House is the first and most important place to which individuals make relation from the birth. Human beings have always wished to maintain peace and security at their living homes.

For human, house is such important that it could be called the center of the world of an individual. Therefore, house must induce the sense of “the center of the world” for an individual in its internal and external space. Recognition and consideration of human’s needs is one of the main subjects in the housing project.

Sustainable development has been one of the important and popular subjects during recent decades which includes three aspects: social, economic and cultural.

Sustainable development means the presentation of solutions for mortal and transient physical, social and economic patterns that prevents the problems of uncontrolled population growth, poverty, destruction of environment and resources, interferences in the ecosystem of the earth and consequently the damages resulted from harmful effects of environmental degradation.

Residence in residential towers can be considered one important development in the process of man dwelling in cities that has turned into the dominant urban dwelling in the contemporary era.

Today, people prefer to live in residential complexes such as towers and complexes than independent houses, because they feel more security and enjoy more facilities in these complexes.

Density is among the preconditions of sustainable dwelling. Without a high quality dwelling, there cannot be an appropriate social process. Many of the residential towers built around the World, though have been constructed in different times and with varying motivations and according to different patterns, do not necessarily match the criteria for creating a favorable residential environment due to the economic, political, and social conditions dominating the society and housing sector.

Generally, social sustainability in a residential space is assessed based on its main foundation, i.e. quality of life, which embodies providing better life conditions in which one can find balance, cooperation, favorability, just equality or the requirements of a life containing social sustainable variables (justice, health, safety, comfort ability, aesthetics, security, children growth, and social identity) and adapting with the building is a precondition of social sustainability.

Our physical environment is effective on the behavior and attitude of residents, so that the duty of architects in designing these collective habitats is to make the design consistent to providing pleasant and desirable environments in order to increase residents’ interaction and hence enhancement of social productivity.

The subject selected for this research is designing residential towers based on the concepts of sustainable social development. Given the selected subject, the aspects of sustainable social development in designing residential towers are investigated in this study.

## 2. Scope of subject

Housing provides suitable conditions for families to achieve their activities. Moreover, it enhances the stability and solidarity of families. Sustainable housing is also effective on the participation of families in the wider society.

House is the closest space to human beings and they experience their first relationship to others in their houses; in fact house is the prerequisite to enter into the wider society.

By conceptualizing the social sustainability in dense buildings such as residential towers, this concept emphasizes on developing an intimate environment and it causes the growth and formation of social relationships in the complex itself and then throughout the neighborhood and it extends the circle of secure familiarities.

By defining this sustainability on the level of neighborhoods, the social sustainability system proceeds over the cities level and it covers the larger part of a country's system.

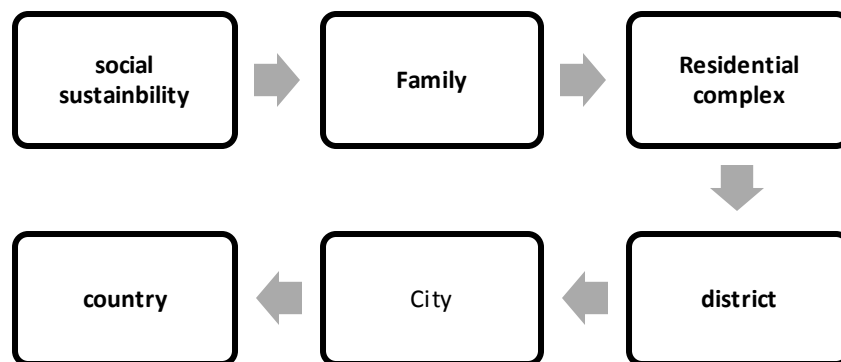


Fig. 1: Scope of the topic

## 3. Sustainable residential development

The range of relevant national policies summarized above can be distilled into a series of high-level aims for successful and sustainable residential development in urban areas. Housing developers, their Design teams, the planning system, and the community they serve, share a common goal to create high quality places which:

- Prioritize walking, cycling and public transport, and minimize the need to use cars;
- Deliver a quality of life which residents and visitors are entitled to expect, in terms of amenity, safety and convenience;
- Provide a good range of community and support facilities, where and when they are needed and that are easily accessible;
- Present an attractive, well-maintained appearance, with a distinct sense of place and a quality public realm that is easily maintained;

- Are easy to access for all and to find one's way around;
  - Promote the efficient use of land and of energy, and minimize greenhouse gas emissions;
  - Provide a mix of land uses to minimize transport demand;
  - Promote social integration and provide accommodation for a diverse range of household types and age groups;
  - Enhance and protect the green infrastructure and biodiversity;
- And enhance and protect the built and natural heritage.



Fig. 2: Six essential elements for delivering the sustainable development goals (UN 2014)

### 3-1. Social dimension

Information Technology will greatly influence the quality of life in the 21st century. The challenge is to use the technology to help overcome numerous global, regional, and local problems that threaten the quality of life. These problems include global overpopulation, intense and potentially socioeconomically destructive global economic competitions, continued pressures on the global environment, increasing levels of regionalized armed conflicts, regional water shortages and other regional environmental problems, and

Local transportation congestion, poverty, crime, and drug abuse. Social scientists must become aggressively involved and accept leadership roles in the conceptualization, development, and implementation of computer-based systems that have broad social impact (Armitage, 2007).

Architectural design can play a large part in influencing the ways that social groups interact. Communist Russia's Constructivist Social condensers are a good example of this; they built buildings which were

Designed with the specific intention of controlling or directing the flow of everyday life to "create socially equitable spaces" Fig. 3.



Fig. 3: components of sustainability (Brundtland 1987)

### 3-2. Public space in residential apartment buildings

One of the significant common denominators in well -functioning residential architecture in the provision of social spaces, interstitial places that offer opportunities for interaction, and exchange. The cloistered monastic courtyards provided inhabitants with a public place of relief from the humble quarters of the private cells. In another context the public houses marking the street corners of nineteenth century British mass terraced housing provided the scale of lounge environment for social gatherings spaces, as private living rooms were modest and inadequately sized for group interaction. In the mass housing solutions of the twentieth century, the street was replaced by the access corridor in high- rise developments, mostly void of places to dwell, providing mere circulation. As these corridors became devices of internalized access, the mounting dis functionality increased in the face of developers slim profit margins.

The modernist residential tower blocks mostly failed to recognize the model established in LeCorbusier's United' habitation in Marseilles, France, completed in 1952, that of an elevated podium (allowing the landscaping to flow beneath the structure, the allocation of public amenities on midblock floors (shops, laundry, etc.), and recreation facilities (pool, playground) on the roof. The need to optimize the return on real estate investment focuses the attention of today's developers of apartment buildings on the apartments themselves; for they are sold according to size and location. Public space may add value, but also increases body corporate fees and maintenance requirements. It is thus not surprising that public space in residential apartment complexes appears all too often to be an afterthought and a way to fill up gaps.

### 4. Effective factors on the sustainable development of residential settlements

A) - **Social and cultural factors:** social and cultural factors alone play important roles in locating the families. This factor may include those variables and criteria that vary depending on the cultural and social conditions of any society.

A significant part of sociocultural literatures on urban environment is about communal spaces like leisure places and children's playground (Felia Srinaga, 2010) where not only the functions required by residents are met but also they are suitable spaces for making social interactions.

Compatible social classes and neighborhoods are one of sociocultural indicators considered important in locating the families' habitat (Azizi & Malek Mohamad Nejad, 2007). On the other hand, the security and peace of the neighborhood plays an important role in the vitality and dynamicity of residential environments and provides a safe place for occurrence of social activities.

According to the studies of Newman, the aim of urban design profession on developing defensible spaces has been a social aim by which the physical structure of urban regions to be designed such that the people become able to utilize available spaces in the cities as much as possible and enjoy a healthy and valuable life (U.S. Department of Housing and Urban Development Office of Policy Development and Research, 1996). At the same time, due to the increasing compression of land-uses and activities in central areas of cities, the closer these residential complexes and spaces to these areas, the more the residents would enjoy social vitality (Duany, 2009).

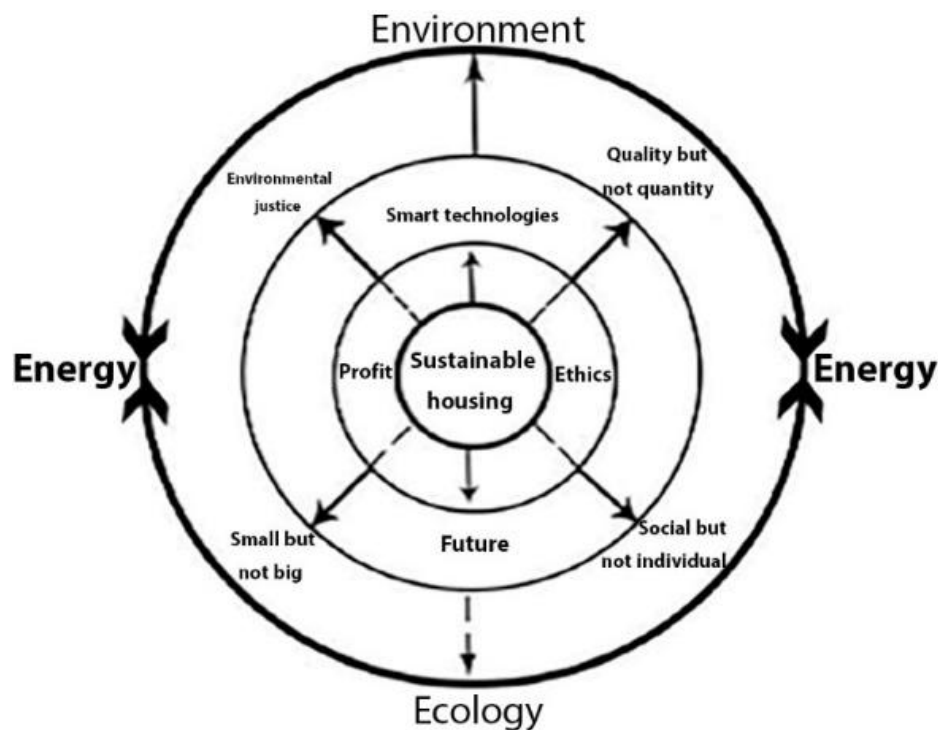


Fig. 4. Cultural changes for a green future<sup>1</sup>

<sup>1</sup> "Sustainable housing", Brian Edwards & David Torent; p. 182



B) - **Environmental- physical factors:** suitable public spaces in vicinity to a residential environment may play significant role in improvement of the quality of the habitat and satisfaction of residents. One of the benefits of open and natural spaces in neighborhoods is facilitation of crisis management at the time of natural and artifact disasters.

In order to prevent the adverse effects of earthquake and other unexpected disasters, the access to residential context of neighborhoods and providence of open spaces must be improved (Bahrainy, 1998).

At the same time, providence of green spaces and parking lots in public spaces around the residential environments may

Help to the sustainability, revival and originality of old neighborhoods and it may enhance the environmental quality of neighborhoods as well (Urban Green Spaces Task Force, 2002).

Suitable perspective for living environment may provide a different experience for the new residents of a residential complex compared to their previous living place. Consideration of this point is critical because many of citizens spend a major part of their life in this perspective (Sugiyama & Ward Thompson, 2007).

In fact, by considering the perspective, green spaces, open spaces and suitable leisure time spaces surrounding any neighborhood, not only a suitable opportunity is provided for parking and roadway access, but also these spaces could be best utilized at the time of crisis.

C) -**Servicing factors:** the routes are one of the main and fundamental elements in mental structure of a city. They appear as lines in the minds of citizens that make the communication and linkage of different points of a city possible.

These communal spaces bear cultural and environmental values formed during different periods for the access and social life (Pakzad, 2005).

Accessibility in the neighborhood is not just for traffic but you can expect a space with diverse functions. Accessibilities may be a space for enjoying the process of movement (Azizi, 2006). Providing the conditions of accessibility in urban planning and design is highly important, such that based on which the residents of a neighborhood must be able to relate to the services of the neighborhood on one hand and to the hierarchical network of movement on the other hand by easy movement. Sustainable residential environment at the territory of a neighborhood must induce the sense of belonging and dependence to the local community for the residents. At the same time, diverse types of life style and habitat must be presented. Sustainable residential environment must be attractive, safe, healthy and secure and it must be easily linked to and accessed to the essential facilities, green spaces and other spaces (Barton, 2003).

Knaap and Talen in their studies concerning smart growth and new-urbanism believe that enhancement of urban services quality depends on the development of combined land-uses and functions, creation of favorable and pleasant spaces and providing diverse accessibilities for pedestrians and drivers (Knaap & Talen, 2005).

D) - **Economical- legal factors:** in economic aspects of the lands, different factors could be investigated. The most significant view is that the land is considered as a good on which the economic relationship of demand & supply governs.



**Table1. Criteria and sub-criteria effective in locating sustainable housing complexes<sup>2</sup>**

Studies	Sub-criteria	Criterion
Felia srinaga,2010 Nasiri nasab Rafsanjani & Habib,2008	Suitable spaces for Social activities and child's play	Socio -cultural factors
Duany,2009	Proximity to Central and public spaces of the city	
U.S.department of housing and urban development office of policy development and research,1996 Carmona, Health,Oc&Tiesdell,2003	Security and peace of the district	
Barton,2003 Azizi&Malekmohamad nejad,2007	Socially compatible neighborhoods(	
Bahrainy,1998 Bernard Manyena,2006	Open spaces for crisis Management and necessity	Environmental - physical factors
Barton,2003 Urban Green Spaces Task Force,2002	Suitable areas for green space	
Azizi& Malek mohamad nejad,2007 Sugiyama & Ward Thompson,2007	Suitable landscape of surrounding environment	
Kim,Yang,Yeo&Kim,2005,Barton,2003	Suitable spaces for parking	

## 5. Innovation Aspects in Research

Given that the general issue of sustainable development is not a new subject in designing, considering this issue in design of residential towers with a social sustainability approach and create spaces with modern functions and presenting a designing solutions to create social sustainability in residential towers, causing the utility in the design of its spaces, Therefore, sustainable development should use appropriate solutions in a modern way to provide a design in order to make this issue as an aspect of invention. The main approach of this paper is a perspective of an approach to the design process of residential tower to features that puts social principles of sustainable development in the design of such houses puts the issue in an important novelty and innovation.

<sup>2</sup> On ANP context, taken from the article written by Arasteh, Mojtaba. al. "Locating sustainable residential complexes using central network analysis process of Yazd City.





## 6. Research Methodology

In this paper descriptive-analytical methods library studies has been used. The results of this research with The goal of constructing social sustainable development deals with improving the relationship between Building and its environment.

In this survey we aim to identify the Social aspects of sustainable developmenton the design of residential towers.

Develop innovative new strategies linked to core competencies and encourage people to view problems or opportunities in a different way.

## 7. Conclusion

The main and numerous problems of current lofty residential buildings has its roots in the lack of correspondence with climatic and social properties. Social behavior of the residents of high buildings are influenced by various factors that maybe building design is only one of them. Our mental and psychological attitude is affected by the physical environment. It is clear that a desirable or exciting environment, whether natural or artificial, is created by the spirit of architects and planners. By focusing on the spatial needs of humans, researchers have considered many factors as important such as spatial security, social relationships, privacy, human dignity and identity. The majority of these needs cannot be supplied unless categorized. The categorization of residential environments require spatial, functional, and social hierarchies, which are entangled with the realm concept.

Generally, the goal of all populations and territories is to achieve social justice and development. To attain this goal, the necessary elements should be supplied. Thus, if you look at development from social- cultural point of view, we can say that development is the same as achieving social justice. Those who are rich in social- cultural aspects, are the main and fundamental condition of securing social justice in the community. Attaining such a society and population is not possible unless investments is made in human resources. For obtaining this capital, environmental potential should be efficiently employed.

According to the cases mentioned in the text of the research, the indices of justice, safety, comfort and peace, aesthetics, security, and child growth as well as social identity can be considered the most influential indices of social sustainability. Thus, when designing a residential environment in order to establish various dimensions of social sustainability and its hierarchies, paying attention to the said indices is necessary. House space as the most life space should enable humans to see their realm and territory, autonomy, and ownership in it, and thus the house meet their needs. According to Beshlar, the most important sense of the house is that it nurtures dream and protects the dreamer. The house enables us to be drowned in our dreams. Designing residential towers and collective habitats needs to take into account physical, social, economic, environmental and other considerations. Planning and physical designing is effective in the amount of social interactions and the security of residential towers. The sustainability of residential towers to a great extent depends on social identity, residential space identity, and the relationship of the residents. Residential towers provide the opportunity to use more and better facilities. Paying attention to human factors in planning and designing can improve life quality in these residential towers. Residential towers design is considered a fundamental issue for social solidarity, personal well- being, and individual independence, and the sustainable process of designing such residential towers are effective in achieving sustainable development. The importance of the issue of social sustainability in residential towers has been among the



main factors of balance and stability in human societies and in fact, the housing of the family has been one of the main pillars of human society. Thus, paying attention to social sustainability in designing dense residential spaces such as residential towers is of high importance. Establishing social interactions is effective in releasing humans, even for a short while, from psychological pressures of machinated life. The result of establishment of the interaction between residents in a residential tower is to perceive the sense of

Collective identity, self- respect, self- esteem, improving social skills, social participation, and meeting human need to love and being in the population.

Social interaction is very important for all age ranges, especially children, from the aspect of growth and talent, and for the elderly for preventing depression and loneliness. Given the studies conducted, it can be concluded that designing the contemporary residential towers has generated some problems for the individual and social life of their residents because they disregard human needs and the consequent psychological outcomes. Social interactions are among the human needs forgotten when designing these buildings. Organizing living environment can be attained through a clear definition of private and public areas as well creating spatial hierarchy; the defined living categorizations increase the sense of belonging to the environment and give identity to residential environments.

In conclusion, we can say that in the presence of the indices of “social sustainability”, a balanced co-existence in the collective habitats in order to achieve the goals of sustainable development is possible.

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